



## UNITED STATES DEPARTMENT OF COMMERCE

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08/905,971	8/5/97	Toyoda	2342-0111P

## EXAMINER

R. ZERVIGON

ART UNIT

PAPER NUMBER

1763 12

## DATE MAILED:

## INTERVIEW SUMMARY

All participants (applicant, applicant's representative, PTO personnel):

(1) Rudy Zervigon

(3) Mathew Lattig

(2) Richard Buckor

(4)

Date of Interview Aug. 16, 2000

Type:  Telephonic  Televideo Conference  Personal (copy is given to  applicant  applicant's representative).Exhibit shown or demonstration conducted:  Yes  No If yes, brief description: \_\_\_\_\_Agreement  was reached.  was not reached.

Claim(s) discussed: 1

Identification of prior art discussed: JP 2-152251 ; U.S. Pat. 4,405,435

Description of the general nature of what was agreed to if an agreement was reached, or any other comments: *Applicant**Cited specific points detailed in the 8/16 fax transmission. To each point there was suggested potential language that would potentially distance the cited prior art.*

(A fuller description, if necessary, and a copy of the amendments, if available, which the examiner agreed would render the claims allowable must be attached. Also, where no copy of the amendments which would render the claims allowable is available, a summary thereof must be attached.)

 It is not necessary for applicant to provide a separate record of the substance of the interview.

Unless the paragraph above has been checked to indicate to the contrary. A FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has not been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW.

Examiner Note: You must sign this form unless it is an attachment to another form.

Zervigon, Rudy

**Subject:** Attorney Interview for 08/905,971  
**Location:** Office

**Start:** Wed 8/16/00 3:00 PM  
**End:** Wed 8/16/00 4:00 PM

**Recurrence:** (none)

**Meeting Status:** Meeting organizer

**Required Attendees:** Zervigon, Rudy; Bueker, Richard



Matt Lattig 703.205.8081  
attorney.

I am awaiting confirmation from the

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# Fax

*Marian, pls Q11 to*

To:	Rudy Zervigon, AU 1763	From:	Matt Lattig
Fax:	(703) 305-3588 812-9378	Date:	August 16, 2000
Phone:	(703) 305-1351	Pages:	6 (including cover sheet)
Your Ref.:	08/905.971	Our Ref.:	2342-111P
Re:	Proposed Discussion points	CC:	

Urgent  For Review  Please Comment  Please Reply  Please Recycle

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**Comments:**

Ex. Zervigon

Attached are proposed discussion points for your review—we will see you this afternoon, Aug. 16, 2000 at 3 pm. Call me if you think we can handle this over the phone before then.  
Regards,

Matt Lattig (703) 205-8081

### Interview Discussion Points

**To Examiner Zervigon:** We have prepared these comments for your convenience, and also in order to expedite the interview process. We hope they prove helpful.

**Summary of the Office Action:** In response to our Amendment, the Examiner removed the primary reference (Tepman et al.) but replaced it with Tateishi et al. (U.S. Patent No. 4,405,435). Essentially, the Examiner maintained the previous rejections, but uses Tateishi et al. as the primary reference, re-asserting each of the rejections in view of the previously applied references.

**Synopsis of the Invention:** The preferred embodiment of the present application can be explained with reference to Fig. 1b for example, where there is illustrated a substrate processing apparatus 1 comprising a substrate transfer section 100, a plurality of modules 300 detachably attached to the transfer section 100, a first robot 20 provided within the loading chamber 10 for transferring substrates to the plurality modules 300. Additionally, and as can be seen with respect to Fig. 1b, the modules 300 are arranged in a vertical fashion atop one another, adjacent to but separated from each other. Further, the substrate processing apparatus 1 includes a series of chambers: a load lock chamber 52, intermediate chamber 54 and substrate processing chamber or reaction processing chamber 56, each set of chambers having a gate valve 62, 64 and 66, respectively therebetween for providing access between the chambers.

Load lock chamber 52 also includes a lift 53 which moves lift boat 70 up and down to collect and then pass semiconductor wafers to the intermediate chamber 54. Intermediate chamber 54 has a second robot 80 which can simultaneously hold and transfer two wafers to the reaction substrate processing chamber 56. A susceptor 90 is included, and has the ability to simultaneously hold two semiconductor wafers in a side by side fashion.

The present application, as viewed in Fig. 1b, provides advantages such that the holding function can be separated from the transferring function by the use of wafer boat 70 and robot 80, the end result being improved efficiency. The transfer efficiency is also aided by maintaining the transfer of wafers to an individual module independent from the transfer of wafers within respective modules 300.

**Distinctions:** The Examiner has primarily focused attention on Fig. 4 of Tateishi et al. However, there appears to be several possible fallacies or inconsistencies with the rejection regarding Tateishi et al., which are provided below:

- a. Initially in each of claims 1 and 14, the plurality of modules are required to be detachably attached to the substrate transfer section. As can be seen in Fig. 4 of Tateishi et al., each of these chambers appear fixedly interconnected to one another, thus there does not appear to be any detachable aspect whatsoever in Tateishi's apparatus. We also note that Takagi, cited again from the previous Office Action to combine with Tateishi et al., does not appear to cure or solve this deficiency.

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- b. The Examiner calls inlet chamber 52 a module, thus implying that two limitations (i.e., (1) the substrate transfer section and (2) a plurality of modules) are anticipated by a single element in Fig. 4 of Tateishi et al. This is improper, as the Examiner must explicitly point out where exactly in Fig. 4 there is a substrate transfer section, and where there is illustrated the transfer modules (two separate claimed structural elements). Clarification is requested.
- c. In each of claims 1 and 14, there is a requirement of a first substrate transfer device provided in the substrate transfer section (this would be analogous to robot 20 in Fig. 1b of the present application). However, referring to Fig. 4 of Tateishi et al., the Examiner cites a first transfer device 62, which is an elevator. However, we note that elevator 62 is not within what is alleged to be the substrate transfer section, that being inlet chamber 52. Clarification is requested.
- d. As in Tepman et al., the various chambers in Fig. 4 of Tateishi are not vertically arranged, and there does not appear to be any suggestion or motivation to arrange these in a vertical fashion, since it utilizes a horizontally configured arrangement together with elevators to move substrates therethrough.
- e. It appears that the Examiner is referring to the entirety of Fig. 4 as a substrate processing chamber which has a hermetic structure. This is improper, since the substrate processing chamber in each of claims 1 and 14 must be a limitation (i.e., must be a subset of the substrate processing apparatus claimed). Further, it is unclear from the Examiner's rejection what is being referred to as the alleged substrate processing chamber in Tateishi et al. Clarification is requested.

Accordingly, we believe that the above represents specific deficiencies in the Examiner's Office Action. Accordingly, we do not believe that the present claims need to be amended. However, we could amend the claims (if required) to incorporate certain advantages of the present application, if the above deficiencies do not persuade the Examiner to withdraw the rejections. One example might be to focus on the ability to separate the holding functions from the transferring functions so as to improve efficiency, and/or to focus the claims on improving efficiency by providing transfer of substrates between modules independent from transfer of substrates within a respective module 300.

We ask you to please review points (a) – (e) prior to the interview, and provide feedback and/or possible claim amendments which could be made to the claims to place them in allowable form. See you at 3 pm today.

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**Current Independent Claims**

1. (As Amended) A substrate processing apparatus, comprising:
  - a substrate transfer section;
  - a plurality of modules, each of said plurality of modules being detachably attached to said substrate transfer section; and
  - a first substrate transfer device provided in said substrate transfer section for transferring substrates to said plurality of modules,
    - wherein said plurality of modules are piled up adjacent to, but spaced separately from one another in a substantially vertical direction,
    - wherein each of said plurality of modules comprises:
      - a substrate processing chamber, having a hermetic structure, for processing said substrates;
      - an intermediate chamber having a hermetic structure and provided between said substrate processing chamber and said substrate transfer section;
      - a first valve provided between said substrate processing chamber and said intermediate chamber, said first valve capable of establishing hermetic isolation between said substrate processing chamber and said intermediate chamber when closed, and capable of allowing said substrates to pass therethrough when opened; and
      - a second valve provided between said intermediate chamber and said substrate transfer section, said second valve capable of establishing hermetic isolation between said

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intermediate chamber and said substrate transfer section when closed, and capable of allowing said substrates to pass therethrough when opened, and

wherein said intermediate chamber is provided with a second substrate transfer device for transferring said substrates to said substrate processing chamber.

14. (Amended) A substrate processing apparatus, comprising:

- a substrate transfer section;
- a plurality of modules, each of said plurality of modules being detachably mounted to said substrate transfer section; and
- a first substrate transfer device provided in said substrate transfer section for transferring substrates to said plurality of modules,

wherein said plurality of modules are piled up adjacent to, but spaced separately from one another in a substantially vertical direction,

wherein each of said plurality of modules comprises:

- a substrate processing chamber, having a hermetic structure, for processing said substrates;
- first and second intermediate chambers provided between said substrate processing chamber and said substrate transfer section, each having a hermetic structure, said first intermediate chamber being located closer to said substrate processing chamber than said second intermediate chamber, and said second intermediate chamber being located closer to said substrate transfer section than said first intermediate chamber;

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a first valve provided between said substrate processing chamber and said first intermediate chamber, said first valve capable of establishing hermetic isolation between said substrate processing chamber and said first intermediate chamber when closed, and capable of allowing said substrates to pass therethrough when opened;

a second valve provided between said first intermediate chamber and said second intermediate chamber, said second valve capable of establishing hermetic isolation between said first intermediate chamber and said second intermediate chamber when closed, and capable of allowing said substrate or said substrates to pass therethrough when opened; and

a third valve provided between said second intermediate chamber and said substrate transfer section, said third valve capable of establishing hermetic isolation between said second intermediate chamber and said substrate transfer section when closed, and capable of allowing said substrates to pass therethrough when opened.

wherein said second intermediate chamber is provided with a substrate holding device capable of holding said substrates, and

wherein said first intermediate chamber is provided with a second substrate transfer device capable of transferring said substrates between said substrate holding device and said substrate processing chamber.